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### SLIDES: Establish True Basin-Wide Institutions: The Return to the River Basin as the Unit of Management

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# **Establish True Basin-Wide Institutions: The Return to the River Basin as the Unit of Management.**

Presentation Outline for the  
Natural Resources Law Center 26th Annual Summer Conference,  
"Hard Times on the Colorado River: Drought, Growth and the  
Future of the Compact",  
June, 2005.

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## Major Arguments:

1. There is a very long history of recognition of the river basin as the natural unit for river development, planning and management.
2. In the U.S. and internationally, there is also a long history of breaking up river basins among many jurisdictions, most having little to do with water.
3. The costs of failure to focus on the river basin are rising rapidly ("jurisdictional externalities" are increasing).

4. Question: Can we move back toward the river basin from the current splintered framework to achieve “win-win” improvements? How?

### **Historical Emphases on the River Basin.**

6000 B.C., origins of large-scale irrigation in Tigris-Euphrates Valley

4000 B.C., Chinese attempts to control the Yellow River

2300 B.C., Indus Basin settled and managed by central authority.

1600 B.C., Dujianyang irrigation/flood control project on Min River (China)

1526+, Mughal Empire in India, new techniques of river management.

All required huge work forces and centralized controls and were the subjects of Wittfogel’s writings on “hydraulic societies” and “oriental despotism”.

Great exception: Egypt experienced 5000 years of sustained irrigated agricultural production by its decentralized system of basin irrigation, in spite of vast

political changes among the ruling class. Not possible to manage the Nile with extant technology.

(Reference: Howe, Charles W., 2002, "Historical Innovations in Water Management, Water Services, Institutions and Technologies", Oxford Encyclopedia of Economic History, Oxford University Press).

## **Modern Emphases on the River Basin.**

1824, U.S. Army Corps of Engineers established and charged with maintaining navigability of the major rivers and harbor maintenance.

1830+, French Ecole National de Ponts et Chaussees promotes unified river management and develops basics of benefit-cost analysis (Jules Dupuis). Agences de Basin still in effect today in France (Ekelund & Hebert, 1973).

1907, U.S. Inland Waterways Commission under Roosevelt's "gospel of efficiency" recommends *multi-purpose river development and centralized control of the rivers*. John Wesley Powell heads Geological Survey(Hays, 1958).

1930's: Depression emergency legislation strengthened federal government coordination, created TVA (with no state consultation) and effected tight coordination among federal water agencies.

1948, British River Boards (England & Wales) established with subsequent extensions of functions to become regional river authorities.

- 1958: Krutilla and Eckstein's 1958 *Multiple Purpose River Development*: an early application of economics to river basin planning .
- 1965, Water Resources Planning Act creates Water Resources Council that to coordinate federal water agencies and authorizes river basin commissions. Some achievements but little money & veto power of members.
- 1968-73, National Water Commission emphasizes the river basin. Excellent but neglected report. Gary Hart study of river basin commissions (1971).
- 1980's, Technical capabilities for remote & satellite monitoring in real time expands capability for basin administration. South Platte example of whole-basin water rights administration. (Kilgour & Dinar, 2001); Bennett & Shope, 2000 on real time basin optimization.
- 1998, Western Water Policy Review Advisory Commission: recommends emphasis on river basins, watershed initiatives and their merger.
- 2001: Inter-American Development Bank backs river basin planning for water quality management (Russell, Vaughn et al).
- 2002: Brazil's Agencia Nacional de Agua initiates program of river basin integrated planning & management.

## **Developments in the Other Direction.**

A. Many federal policies, regulations and laws have intentionally reduced federal control over water:

1877 Desert Land Act: settlers must claim water under state law;

1897 National Forest Act: water users on public domain must comply with state law;

1902 Reclamation Act: projects must acquire water in conformity with state law;

1920 Federal Power Act: instream flow rights must be claimed under state law;

1988 McCarren Amendment: all federal agencies must claim water under state law except Winters' Doc.

B. Reagan administration abolished Water Resources Council and related river basin commissions, 1982. Loss of Federal coordination. Current revival of interest WRC.

C. Resultant mixed policy picture:

1. Federal government retains control over navigable rivers and their tributaries;
2. International treaty power over-rides all state water laws;
3. Army Corps of Engineer programs (primarily flood control) never subject to state control;
4. AZ v. CA, 1963: Secretary of Interior given control over lower Colorado River.
5. Endangered Species Act and Clean Water Act over-ride state water administration as needed.
6. Secretary of Interior states that states must find solutions to water problems (2004).
7. Popularity of local watershed initiatives raises question of compatibility with basin objectives (Kenney et al, 2000).

**Evidence that failure to focus on the river basin is increasingly costly.**

- A. Past and current status of the Colorado River (Booker severe, sustained drought study, 1995): majority of drought damage under Law of the River was to non-consumptive uses; damage to consumptive uses reduced 85% through intra-state re-allocation.
- B. Problems on the Upper & Middle Rio Grande (Booker, Michelsen & Ward, 2005): drought damages reduced 20-33% by elimination of compact and stateline barriers.
- C. Losses on the Lower Rio Grande (Texas Center for Policy Studies, 2002; Tidwell et al, 2004; Stubbs et al, 2004): Complex history leads to inefficient allocation.
- D. Failure of agreement on the Apalachicola-Chattahoochee-Flint Basins in Southeast (Lipford, 2004): endless litigation & no settlement.
- E. Klamath River controversy of 2001. "Water bank" established to lease irrigation water for instream use (USGAO, 2005).
- F. Idaho faces losses from lack of coordinated surface water-groundwater management on the Snake.
- G. International river basins facing increasing conflict: Nile, Ganges, Mekong, Okavango.
- H. Crises are forcing consideration of new compacts, new "laws of the river", revisions of sacrosanct regulations & treaties: Colorado River, Rio Grande.



**Where are we headed? Is it possible to move toward basin-wide planning/management starting from the current splintered framework?**

**A. Interstate transfers are taking place:**

1. Arizona-Nevada water banking: AZ recharges excess CAP water for future use, exchanging that water for Nevada withdrawals from Lake Mead. 1.25 maf guaranteed for \$ 100 million up front plus full costs of recharge and recovery.
2. Arizona-MWD water exchange: NV's excess River water stored & used by MWD, later foregoing withdrawals in favor of NV.
3. Deschutes Resources Conservancy restores streamflows on interstate river (CA-OR) by leasing agricultural water.

**B. New monitoring and surveillance technologies have increased capabilities of administering river basins as a whole on "win-win" bases. South Platte example; Dinar-Kilgour (1995,2001); Lewis, Howe & Shope, 2000).**

**C. Applying the Columbia River Treaty principle of "benefit sharing" in place of just water sharing (Krutilla, 1958).**

**D. Compensation policies need strengthening to reconcile efficiency & equity as changes are made. Examples: City of Aurora payments to counties of origin; "Windy Gap" Project compensation to ranchers & counties.**

E. Endangered Species Act, Clean Water Act are forcing interstate cooperation: 3 state Platte River agreement; Middle Rio Grande; Colorado River species restoration.

F. Expanding the geographical scale of water markets:

1. intra-state gains potential is large (Vaux & Howitt, 1994; Booker, 1995);

2. historical proposals that didn't fly:

a. Ben Harding (1984 paper) proposes leasing of unused Colorado consumptive allotments.

b. the Galloway proposal (Gross, 1985): dams on the White & Yampa Rivers in Colorado to lease water to Lower Basin. Legal objections: Colorado River Compact "exclusive use", Congressional intent, Upper Basin Compact.

c. Resource Conservation Group Proposal (1990) : reduce irrigated acreage in Colorado on a rotating basis, leasing reduced consumptive use to Lower Basin. Objections: "exclusive use" in CRC; contrary to intent of CRC; measuring consumptive use (Viscoli, 1991).

d. Rep. Ben Nighthorse Campbell proposes leasing to the Lower Basin the water decreed for unbuilt projects authorized under the Colorado River Project Act.

e. Colorado River Board of California Proposal for an Interstate Water Bank on the Colorado River (1991): to allow 1-year interstate leasing

of "wet water" through state water agencies\_ under umbrella of 7-state bank at fixed prices. Objections: California's need to reduce use to 4.4 maf/yr; need for reallocation within California. Colorado adamantly opposed.

f. 1991 Governor Roy Romer (Colorado) proposes state-to-state leasing of unused consumptive use allotments through contracts to forego development for 40 years.

G. Increasing flexibility of interstate compacts. Interstate compacts frozen in time (Muys, 2001). New or revised compacts should facilitate interstate water banking. In my view such arrangements are necessary legal and inevitable in many basins (Muys, 2004)

#### H. Problems with Interstate Water markets:

1. Who protects instream values? Booker (1995) found that major losses from extended drought were to instream uses (water quality, eco-systems, recreation, hydro-power). Public & private agencies can lease water through water banks: Idaho Power from agriculture (2001 & other years) and Bureau of Reclamation on the Klamath (USGAO, 2005).
2. Will water markets/banks really work? Colorado established a water bank in the Arkansas River Valley that simply did not work. No transactions.
3. Property rights in water are uncertain, e. g. real Upper Basin allocations under the Compact and the Upper Basin Compact.

## **Recommendations.**

1. Activate the California water bank proposal on a trial basis. Very conservative arrangement.
2. Authorize and encourage federal & state agencies to lease water through water banks for protection of instream values.
3. Further evaluate a "Romer-type" contractual leasing arrangement between Upper Basin and Lower Basin states to reward Upper Basin conservation & discourage unproductive project commitments just to "tie down" the water in the Upper Basin.

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# Establish True Basin-Wide Institutions:

The Return to the River Basin as the Unit of  
Management.

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# Resume of Main Points

There is a long history of focusing on the river basin as the unit of planning and management.

- There is also a long history of dividing the river basin up among political jurisdictions.
- Costs of failing to focus on the river basin are rising sharply.
- There are “win-win” steps that can take us in the direction of the river basin.
- Ref: Howe, “The Return to the River Basin...”, Jour. Contemporary Water Research & Education, May, 2005.

# Steps Toward Basin-Wide Cooperation and Management.

- History of states' cooperation in basin-wide institutions: states collaborate when purpose is well-focused.
- Remote sensing extends potential scope of basin management & allows all parties to monitor withdrawals, storage, etc., increasing trust and enforcement of agreements (Kilgour-Dinar, 2001; EOS 5/05).
- “Benefit sharing”: the U.S.-Canada Columbia River Case (John Krutilla, 1967).

# Extending Water Markets to Interstate Levels

- Need to clarify states' water property rights, e.g. uncertainties in Upper & Lower Basin compacts.
- 1984 Galloway proposal to lease 1 maf of Yampa/White water to lower basin. Issues: Yampa, Compact III(a) & Congressional intent.
- 1984 Ben Harding (Hydrosphere) suggests leasing of Colorado's unused consumptive allotment.
- 1990 Resource Conservation Group "wet water" proposal to lease foregone consumptive use with sharing of proceeds. Issues: III(a), accounting problems, "spirit of the compact".

- 1991 Colorado River Board of California  
“Conceptual Approach & Water Bank  
Proposal”:

- 1 year interstate leases through the bank on a state-to-state basis;
- transactions first cleared with state agency;
- “wet water” only not exceeding 1 maf/year;
- price set annually by Interstate Forum (problem);
- Proposal solidly rejected by Colo.Gov. Romer & other Upper Basin governments.

- 1991. Gov. Roy Romer proposal to contract with Lower Basin for payment for non-development of unused consumptive allotment.
- Appears justified by current NV-AZ-CA arrangements for groundwater & surface storage.

# Protecting Instream Values.

- Charge state & federal agencies to protect instream values through market leasing:
  - Booker et al find instream losses greatest during extended drought in the Colorado River; examples of leasing for instream use:
    - 2001. Idaho Power leases ag water from 400 farmers at \$ 450/acre, 150,000 acres (Colby);
    - Reclamation leases water on the Klamath for instream purposes (U.S. GAO, March, 2005).

# Increasing Flexibility of Interstate Compacts.

- “...compact allocations, unlike decrees in equitable apportionment..., are frozen in time...” (Muys, Feb. 2001).
- “...new or revised compacts should provide authority... to facilitate interstate ... water banking on a voluntary basis...In my view, such arrangements are necessary, legal and inevitable in many interstate basins.” (Muys, May, 2004).

# Principles for the Design of Flexible Compacts

- (Personal notes from Utton Center 3/05 workshop on model interstate compacts):
  - Allow for adaptive management: "expect the unexpected";
  - Maximize basin-wide economic benefits while allowing for equitable division of benefits thru compensation & allocation of hydrologic risk;
  - Protect riparian systems and cultural values;
  - Allow for the role of science.



# Recommendations.

- Activate the California water bank proposal on a trial basis.
- Authorize & encourage public agencies to lease water through the bank for protection of instream values.
- Further evaluate a Romer-type contractual arrangement to reward Upper Basin conservation & discourage low productivity Upper Basin projects.